

REMARKS

Applicant would like to thank the Examiner for the careful consideration given the present application. The application has been carefully reviewed in light of the Office action, and amended as necessary to more clearly and particularly describe the subject matter which applicant regards as the invention.

Claims 1-31 remain in the application. Claims 6-8, 16, 17, 24, 29 and 30 have been indicated as including allowable subject matter. Claims 1, 5, 6, 8, 21 and 22 have been amended. Claims 6 and 8 have been rewritten in independent form. Claims 4 and 23 have been cancelled.

The Invention

A method of inspecting a workpiece during a production run in which workpieces are supplied to workstations by an autoloader. In accordance with the method, the supply of the workpieces by the autoloader is performed in accordance with a supply control routine. When it is desired to inspect a workpiece in a workstation, the supply control routine is interrupted after its then current cycle and the autoloader is used to move the workpiece to a quality control station. The supply of the workpieces in accordance with the supply control routine is then resumed. While the autoloader is operating in accordance with the supply control routine, the workpiece is inspected. If the workpiece is acceptable, the supply control routine is again interrupted after its then current cycle and the autoloader is used to move the workpiece to an output area. The supply of the workpieces in accordance with the supply control routine is then resumed again.

The References of Record

U.S. Patent 6,502,294 to Kusmierczyk et al. (hereinafter Kusmierczyk) is directed to a transfer line workpiece inspection apparatus and method. The apparatus includes a plurality of different kinds of machining units disposed at respective machining stations along a transfer path. A workpiece transporter moves workpieces along the transfer path to position each of the workpieces at each of the machining stations and allows each of the machining units to machine each of the workpieces as the workpieces move along the transfer path. A controller connected to the machining units responds to an inspection command by causing all machining units downstream from a designated machining unit along the transfer path to allow a workpiece selected for inspection to pass by without being machined by the downstream units.

U.S. 6,730,545 to Chang (hereinafter Chang) is directed to a method of performing back-end manufacturing of an integrated circuit (IC) device. A die-strip is processed through a front-of-line assembly portion which comprises a plurality of sub-stations operating on an in-line basis. The die-strip is then automatically provided to an end-of-line assembly portion. The die-strip is then processed through an end-of-line assembly portion which comprises a plurality of sub-stations operating on an in-line basis. The die-strip is then automatically provided to a test assembly portion. The die-strip is then tested by the test portion and then automatically provided to a finish assembly portion.

U.S. Patent 6,324,749 to Katsuura et al. (hereinafter Katsuura) is directed to a vehicle assembly line including a series of function zones (wiring zone, interior equipment, exterior equipment, etc.). Inspection and repair are conducted in

inspection sections and repair sections individually attached to individual functional zones. Since inspection and repair can be finished within each functional zone, defects can be quickly found and quality in each zone can be guaranteed to thereby improve assembly line production efficiency.

U.S. Patent 5,193,662 to McCulloch et al. (hereinafter McCulloch) is directed to a guide structure for a lift and carry conveyor system. The system uses fixed guide rails which guide lower portions of a part as the part moves between sequential conveyor sections. The guide rails ensure that the part continues to be properly guided as it moves between the sequential stations, or between a workstation and a conveyor section.

The Rejections under §112

Claims 21-22 and 25 stand rejected under 35 U.S.C. 112, second paragraph, as being indefinite as referring to step (h) which is missing from the claims. Claims 21 and 22 have been amended to overcome this deficiency and clarify the steps of the claims.

The Rejections under §103

Claims 1, 11 and 13 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Kusmierczyk in view of Chang. For the following reasons, the Examiner's rejection is traversed.

Claim 1 has been amended to include features from claim 4, notably adding a

step of "informing the control routine that non-selected workpieces should not be delivered to the selected one of the workstations." Thus, if the workstation is deficient in some way, other non-selected workpieces will not be damaged in that workstation.

Even if the references were combined in the manner proposed by the Examiner the claimed invention would not result. Kusmierczyk teaches removing a selected workpiece from an assembly line by passing the selected workpiece past a downstream group of workstations without manipulating the selected workpiece. Then Kusmierczyk teaches returning the selected workpiece to the assembly line and passing the selected workpiece through the workstations in which the workpiece was previously manipulated, without performing additional manipulation. Kusmierczyk does not teach preventing the supply of non-selected workpieces to the selected workstation or any other workstation when a selected workpiece is removed for inspection. Nor does Kusmierczyk teach refraining from performing operations on any non-selected workpieces. Chang teaches only movement of a workpiece from the end of an end of the line assembly portion to a test assembly portion. Chang does not teach preventing the supply of workpieces to any selected workstation nor preventing operations from being performed at any selected workstation.

Additionally, Katsuura was cited in the rejection of claim 4, which has been incorporated into claim 1, however, Katsuura does not cure the deficiencies of Kusmierczyk and Chang. Katsuura teaches inspection/repair within each functional zone, but does not disclose refraining from supplying workpieces to any selected workstation or refraining from performing operations on workpieces at any selected

workstation.

Because the cited references, alone or in combination do not teach all of the features of amended claim 1, reconsideration and withdrawal of the rejection of claim 1 is respectfully requested.

Claims 11 and 13 depend directly from claim 1 and are believed to be allowable at least for the reasons stated above. Reconsideration and withdrawal of the rejection of claims 11 and 13 is respectfully requested.

Claims 2-5 and 9-10 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Kusmierczyk and Chang in view of Katsuura. For the following reasons, the Examiner's rejection is traversed.

Claims 2, 3, 5, 9 and 10 depend directly or indirectly from claim 1 which is believed to be patentable over the proposed combination of Kusmierczyk, Chang and Katsuura, as stated above.

Additionally, regarding claim 2, even if the references were combined in the manner proposed by the Examiner, the claimed invention would not result. The combination does not teach the feature of step (j.), namely moving a selected workpiece from a quality control station to a desired one of a plurality of workstations (workstations introduced in claim 1). Rather, Kusmierczyk teaches removing a selected workpiece from the end of an assembly line and then after inspection, returning the selected workpiece only to the beginning of the assembly line. There is no option to select a desired workstation from amongst a series of workstations and return the workpiece to the desired workstation. Katsuura does nothing to remedy the deficiencies of Kusmierczyk. Rather, Katsuura teaches transporting a workpiece from an inspection station to an adjacent repair station. However, the repair station

is the only station to which the workpiece can be moved, thus, there is no capability to select from "a plurality" of workstations. Chang teaches only movement of a workpiece from a test portion to a finish assembly portion. Claim 3 depends directly from claim 2 and is also believed to be allowable at least for this reason.

Thus, neither Kusmierczyk, Katsuura, Chang, nor a combination thereof teach or suggest a step of moving a selected workpiece from a quality control station to a desired one of a plurality of workstations.

For at least the reasons stated above, reconsideration and withdrawal of the rejection of claims 2, 3, 5, 9 and 10 is respectively requested.

Claim 12 stands rejected under 35 U.S.C. §103(a) as being unpatentable over Kusmierczyk and Chang and further in view of McCulloch.

Claim 12 depends directly from claim 1. As stated above, Kusmierczyk and Chang fail to teach or suggest "informing the control routing that non-selected workpieces should not be delivered to the selected one of the workstations", as required. McCulloch does nothing to cure the deficiencies of Kusmierczyk and Chang in this regard. McCulloch teaches a lift and carry conveyor system with an improved structure, but teaches nothing regarding transfer methods, especially methods including an inspection process.

For at least the following reasons, reconsideration and withdrawal of the rejection of claim 12 is respectfully requested.

Claim 14 stands rejected under 35 U.S.C. §103(a) as being unpatentable over Kusmierczyk in view of McCulloch. For the following reasons, the Examiner's rejection is traversed.

Even if the references were combined in the manner proposed by the

Examiner, the claimed invention would not result. The proposed combination does not teach or suggest moving a first workpiece from a first workstation directly to a quality control station using an autoloader and moving a second workpiece from an input area directly to a second workstation using an autoloader, as required. Rather, Kusmierczyk teaches manually moving a workpiece to an area for inspection, only after the workpiece has passed through the remaining workstations on an assembly line. Further, Kusmierczyk does not teach or suggest the direct movement of workpieces from an input area to a second workstation. Kusmierczyk only teaches the sequential movement of workpieces from an input area to first workstation, first workstation to a second workstation, etc. McCulloch does nothing to cure the deficiencies of Kusmierczyk. McCulloch teaches a lift and carry conveyor system with an improved structure, but teaches nothing regarding transfer methods, especially methods including an inspection process. Thus, neither Kusmierczyk, McCulloch, nor the combination thereof teaches all of the features of claim 14. Reconsideration and withdrawal of the rejection of claim 14 is respectfully requested.

Claims 15, and 18-20 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Kusmierczyk, and McCulloch as applied to claim 14 and further in view of Katsuura.

Claims 15 and 18-20 depend directly from claim 14. The Examiner proposed that a combination of Kusmierczyk and McCulloch would render claim 14 unpatentable. As described above, even if the Kusmierczyk and McCulloch references were combined as proposed by the Examiner, the claimed invention would not result. And even if the Katsuura reference is added to the combination, the claimed invention would not result.

The proposed combination does not teach or suggest moving a first workpiece from a first workstation directly to a quality control station using an auto loader and moving a second workpiece from an input area directly to a second workstation using an autoloader, as required. Rather, Kusmierczyk teaches manually moving a workpiece to an area for inspection and only after the workpiece has passed through the remaining workstations on an assembly line. Further, Kusmierczyk does not teach or suggest the direct movement of workpieces from an input area to a second workstation. Kusmierczyk only teaches the sequential movement of workpieces from an input area to first workstation, first workstation to a second workstation, etc. McCulloch does nothing to cure the deficiencies of Kusmierczyk. McCulloch teaches a lift and carry conveyor system with an improved structure, but teaches nothing regarding transfer methods, especially methods including an inspection process. Katsuura does not cure all of the deficiencies of Kusmierczyk and McCulloch. Katsuura teaches sequential movement of workpieces along an assembly line, but not movement from an input area directly to a second workstation. Thus, Kusmierczyk, McCulloch, Katsuura, alone or in combination, do not teach all of the features of claim 15 and 18-20. Reconsideration and withdrawal of the rejection of claims 15 and 18-20 is respectfully requested.

Claims 26-28 and 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kusmierczyk, Chang and McCulloch as applied to claim 14 above and further in view of Katsuura.

Claim 26 describes the function of an autoloader, which can transport parts directly from location to location, for example from a workstation to a quality control station. Even if the Kusmierczyk, McCulloch, Chang and Katsuura references were

combined, in the manner proposed by the Examiner, the claimed invention would not result. The proposed combination does not teach or suggest moving a first workpiece from a first workstation directly to a quality control station using an autoloader and moving the selected workpiece from the quality control station directly to an output area using an autoloader and moving the selected workpiece from the output area directly to a second input area in a second zone, as required. Rather, Kusmierczyk discloses a method of inspection where after receiving an inspection command, the workpiece is passed through a series of workstations to an inspection station at the end of an assembly line and inspected. Katsuura teaches only movement of a workpiece from a first section to a second section through both an inspection station and a repair station, but not directly from the inspection station to a second station. McCulloch and Chang do nothing to cure the deficiencies of Kusmierczyk and Katsuura. McCulloch teaches a lift and carry conveyor system with an improved structure, but teaches nothing regarding transfer methods. Chang does not teach a plurality of zones wherein each zone comprises a plurality of workstations that perform the same type of operation. Neither of the cited references, alone or in combination, teach direct movement from a first workstation to a quality control station and then to a second input area in a second zone. Neither of the cited references teach the function of the claimed autoloader. Thus, reconsideration and withdrawal of the rejection of claim 26 is respectfully requested.

Claims 27, 28 and 31 depend directly from claim 26 which is believed to be allowable for the reasons stated above. Reconsideration and withdrawal of the rejection of claim 27, 28 and 31 is respectfully requested.

In light of the foregoing, it is respectfully submitted that the present application is in a condition for allowance and notice to that effect is hereby requested. If it is determined that the application is not in a condition for allowance, the Examiner is invited to initiate a telephone interview with the undersigned attorney to expedite prosecution of the present application.

If there are any additional fees resulting from this communication, please charge same to our Deposit Account No. 18-0160, our Order No. HON-14853.

Respectfully submitted,

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